17 November 1975

MEMORANDUM FOR THE RECORD

SUBJECT: Age Distribution, Projection Model

1. On 11 September 1975 a model was presented to Messrs. Blake, Janney and McMahon by the Plans Staff. Representing Plans Staff were [redacted] STAT

2. The model represented a request made by Mr. Blake (for Mr. Colby) [redacted] STAT querying the ability of the Agency to recruit young professionals in relation to (current) ceiling restrictions and projected ceilings.

3. A decision was made by [redacted] STAT at the time of the request (about three weeks before the presentation) to use an existing Dynamo model as the vehicle on which projections would be made.

4. As the model was already in existence, it was only necessary to calculate the appropriate vectors, make the computer runs and plot results.

5. Vector calculations were done by obtaining typical rates (FY 75) for conversions, direct hires and separations. It should be noted that the use of the word "rates" is an implication of the design philosophy behind the model; that is--there is a relation between on-duty strength and the numbers of persons hired, separated, or converted. This premise has been validated within limits by past experience, e.g., earlier "hand-crank" models, and seems to hold for the short run in these models.

6. Data were obtained via [redacted] STAT (SRB) from the current PERSIGN data base. Runs were done by age and Career Service. Hand counts were necessary to produce data for age groups, which accounted for much of the effort.

7. Data supplied [redacted] STAT included current on-duty strength, separations, and direct hires. Conversion data were obtained from a separate report, as well as the number of CTs coming on board and the approximate age distribution of those CTs. The purpose of the distinction between the two sources of data is to indicate that on-duty strength, separations, and direct hires by age group were special request items, and the conversions, CT data, were obtained from existing reports generated [redacted] STAT

8. The historical basis for the model extends back two years (at least my association with it). The basic model consisted of a column of numbers indicating the number of persons in an age group or GS level. A series of rates were applied against the numbers to generate the next column (which represented the next period) e.g.; STAT

[redacted]

9. The original model was a "hand and crank" operation where all the vectors were computed by hand. The second version of the model consisted of a Basic program written for use on DIAOLS. This program was used for a DDO projection and seemed to work quite well.

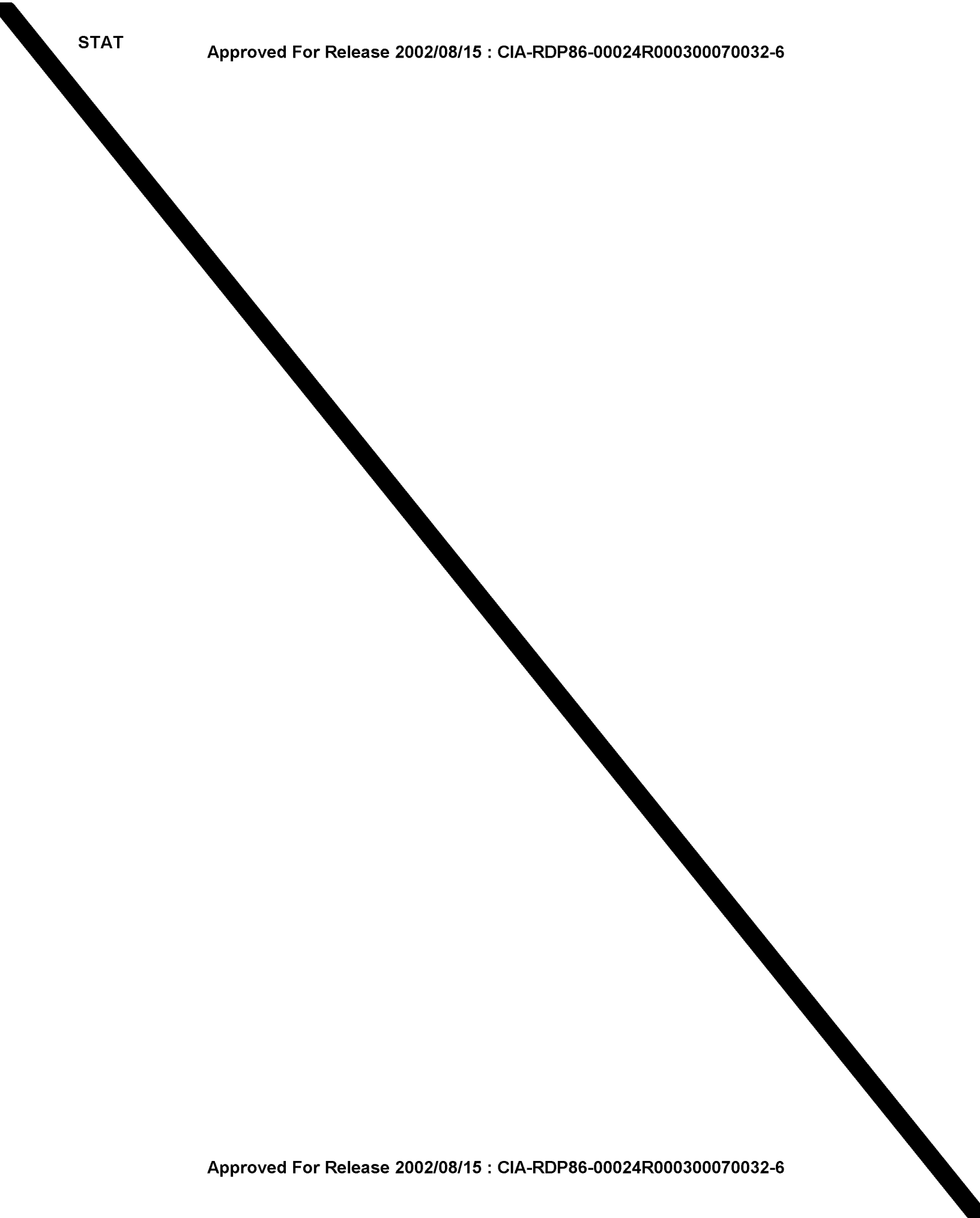
10. About six months ago a Dynamo model was constructed by the ISTB/OTR. Testing and development of this model by OP/Plans Staff indicated that it could perform all the functions of the model programed in Basic along with the advantages of the Dynamo language; flexibility, easy to modify, worked on CMS, easy to make multiple runs and comparisons.

11. After modification and testing this model was used in the presentation referenced in this memorandum. Since the original presentation, additional presentations have been made to Messrs. Janney, STAT

STAT [redacted]

[redacted]

Plans Staff
Office of Personnel



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THE PROJECTION OF AGE DISTRIBUTION MODEL

The Projection of Age Distribution model is being used currently in the Office of Personnel to analyze on-duty professional personnel age distributions and to determine the feasibility of hiring additional young professional officers. Projections of the current age distributions under the influence of several different management policies have been made, and it is expected that as new policy options become known, they also may be tested on the model.

The model is based on the System Dynamics methodology, that is, a focus on the structure and behavior of systems composed of interacting feedback loops. In this model the design philosophy is based on the assumption that there is a relationship between the number of persons in an age group and the flows into and out of the age group. This design philosophy has been incorporated into a computer-based model which is programed in the Dynamo programing language.

Future modifications to the model which are feasible include more sophisticated separation algorithms, switches to turn on or off policies which affect flows at various times, and random noise in the flows to assess the impact of random variations in the model. The possibility of an optimizing algorithm also exists.

Many personnel policies can affect future age distributions in the Agency. Consequently, it is useful for the manager to have a model that can simulate the effects of various alternate policies and thus facilitate the choice of preferred policies. The System Dynamics methodology provides an excellent vehicle on which models for the testing of policies can be built. The current model is an example of this method and is capable of further development once we have a better understanding of the causal relationships affecting separations and accessions.